

Remarks

A. Pending Claims

Claims 409-465 are currently pending. Claim 415 is withdrawn from consideration as being directed to nonelected species.

B. Election of Species

The Office Action states: “Regarding Species A(1), the traversal is on the ground that species (2)-(4) are subsets of species (1). Remarks, at 2. However, species (1) consists of embodiments with heaters and methods of heating comprising a single ferromagnetic material only (i.e., without any additional material (ferromagnetic or non-ferromagnetic).” Applicant submits that the claims use the terms “comprises” or “comprising” in reference to inclusion of the ferromagnetic material in the features of the claims. Applicant’s use of the terms “comprises” or “comprising” does not limit the claims to a single ferromagnetic material as per MPEP § 2111.03, which states:

The transitional term “comprising”, which is synonymous with “including,” “containing,” or “characterized by,” is inclusive or open-ended and does not exclude additional, unrecited elements or method steps.”

Therefore, species (1) is not limited to only a single ferromagnetic material (i.e., without any additional material (ferromagnetic or nonferromagnetic)) as stated in the Office Action. Applicant respectfully requests removal of the election requirement.

C. The Claims Are Not Obvious Over EP130671 In View of Holen Pursuant To 35 U.S.C. §103(a)

Claims 409-411, 418-435, 437, 439-442, 445-455, and 458-465 were rejected under 35 U.S.C. §103(a) as being unpatentable over European Patent Application 0130671 to Rose (hereinafter “EP130671”) in view of U.S. Patent Application Publication No. 2002/0028070 to

Holen (hereinafter "Holen"). Applicant respectfully disagrees with these rejections.

To reject a claim as obvious, the Examiner has the burden of establishing a *prima facie* case of obviousness. *In re Warner et al.*, 379 F.2d 1011, 154 U.S.P.Q. 173, 177-178 (C.C.P.A. 1967). To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974), MPEP § 2143.03.

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). *In re Lee*, 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002). *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), MPEP § 2143.01.

A statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). *In re Kotzab* 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1318 (Fed. Cir. 2000).

Claim 409 describes a combination of features including: "an AC supply configured to provide AC at a voltage above about 200 volts; an electrical conductor comprising one or more ferromagnetic sections, wherein the electrical conductor is electrically coupled to the AC supply,

wherein at least one of the ferromagnetic sections is configured to provide an electrically resistive heat output during application of AC to the electrical conductor such that heat can transfer to material adjacent to such ferromagnetic section, and wherein such ferromagnetic section is configured to provide a reduced amount of heat above or near a selected temperature during use; and wherein the selected temperature is at or about the Curie temperature of the ferromagnetic section.”

Claim 432 describes a combination of features including: “providing an AC at a voltage above about 200 volts to one or more electrical conductors to provide an electrically resistive heat output, wherein at least one of the electrical conductors comprises one or more electrically resistive sections; and wherein at least one of the electrically resistive sections comprises an electrically resistive ferromagnetic material and provides a reduced amount of heat above or near a selected temperature, and wherein the selected temperature is within about 50 °C of the Curie temperature of the ferromagnetic material.”

Claim 452 describes a combination of features including: “an AC supply configured to provide AC at a voltage above about 200 volts; an electrical conductor coupled to the AC supply, and wherein the electrical conductor comprises one or more electrically resistive sections, wherein at least one of the electrically resistive sections comprises an electrically resistive ferromagnetic material, wherein the electrical conductor is configured to provide an electrically resistive heat output during application of the AC to the electrical conductor, and wherein the electrical conductor is configured to provide a reduced amount of heat above or near a selected temperature that is about 20% or less of the heat output at about 50 °C below the selected temperature during use; and wherein the selected temperature is at or about the Curie temperature of the ferromagnetic material.”

The cited art does not appear to teach or suggest systems or methods for heating at an AC voltage above about 200 volts in which a reduced amount of heat is provided above or near a selected temperature as described in the above-quoted features of the claims.

EP130671 states: "Below the Curie temperature, the majority of the current flows in the magnetic layer when the thickness of this layer is nominally one skin depth of the material below the Curie temperature. In the region of the Curie temperature, the majority of the current now flows in the copper and the resistance drops dramatically." (EP130671, page 3, lines 1-6). EP 130671 states: "In operation, as the Curie temperature of the first layer is approached and its permeability rapidly decreases, the current spreads into the copper layer and into the second magnetic layer. The total resistance of the structure, due to the presence of the copper, drops dramatically providing a high autoregulating ratio." (EP130671, page 8, lines 9-14). EP130671 appears to teach or suggest electrically coupling one or more other materials to the ferromagnetic material and allowing the current to conduct into the other materials as the Curie temperature of the ferromagnetic material is approached to lower the electrical resistance of the structure.

Holen states: "For acting partially as a heating element the metallic tube is preferably made of a ferromagnetic material." (Holen, paragraph 0010). Holen further states: "To avoid such a problem the metal tube 1 in the section 6 will be heated by direct impedance heating." (Holen, paragraph 0015). Holen further states: "In the case of a stop of crude oil transportation in the metal tube 1 before and/or during and/or after oil stop section 6 of the metal tube 1 will be heated by direct impedance from the single phase power supply 7 with the service voltage. The section 6 heated by an AC current flow secures that at the time of oil transportation starting the remained crude oil will have sufficiently low viscosity." (Holen, paragraph 0018).

Holen does not appear to teach or suggest using the ferromagnetic material as anything other than a direct impedance heater. Holen does not appear to teach or suggest limiting the current at anytime to a skin depth of the ferromagnetic material or allowing the current, at any time, to conduct into other materials to lower the electrical resistance of the heater as described in EP130671. Thus, there is no suggestion or motivation in Holen to utilize the teachings of Holen and apply them to the teachings of EP130671. Applicant submits that a person skilled in the art would have no objective reason to combine the teachings of EP130671 and Holen to teach all the claim limitations including, but not limited to, systems or methods for heating at an AC voltage above about 200 volts in which a reduced amount of heat is provided above or near a selected

temperature.

If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Claim 409 describes a combination of features including: “wherein the selected temperature is at or about the Curie temperature of the ferromagnetic section.” Claim 432 describes a combination of features including: “wherein the selected temperature is within about 50 °C of the Curie temperature of the ferromagnetic material.” Claim 452 describes a combination of features including: “wherein the selected temperature is at or about the Curie temperature of the ferromagnetic material.”

Holen also does not appear to teach or suggest operating in the region of the Curie temperature. Holen appears to teach or suggest operating at temperatures that maintain a sufficient low viscosity of crude oil. Operating at temperatures at or near the Curie temperature may cause non-desirable effects in the system (e.g., pyrolysis of the crude oil). Thus, Holen does not appear to teach or suggest operating at temperatures anywhere near temperatures at which the heater would provide a reduced amount of heat. Combining the teachings of EP130671 with Holen would appear to teach away from the intended purpose of the invention of Holen of operating at temperatures below the Curie temperature.

Applicant submits, in addition, that some of the claims dependent on claims 409, 432, and 452 are separately patentable.

Claim 410 describes a combination of features including: “wherein the AC supply is configured to provide the AC at a voltage above about 650 volts.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 410, in combination with the other features of the claim.

Claim 411 describes a combination of features including: “wherein the AC supply is configured to provide the AC at a voltage above about 1000 volts.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 411, in combination with the other features of the claim.

Claim 418 describes a combination of features including: “wherein at least one of the ferromagnetic sections comprises iron, nickel, chromium, cobalt, tungsten, or a mixture thereof.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 418, in combination with the other features of the claim.

Claim 419 describes a combination of features including: “wherein at least one of the ferromagnetic sections has a thickness of at least about $\frac{3}{4}$ of a skin depth of the AC at the Curie temperature of such ferromagnetic sections.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 419, in combination with the other features of the claim.

Claim 420 describes a combination of features including: “wherein the heat output below the selected temperature is greater than about 400 watts per meter of the electrical conductor.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 420, in combination with the other features of the claim.

Claim 421 describes a combination of features including: “wherein at least one portion of the electrical conductor is configured to comprise a relatively flat AC resistance profile in a temperature range between about 100 °C and 750 °C.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 421, in combination with the other features of the claim.

Claim 422 describes a combination of features including: “wherein at least a portion of the electrical conductor is longer than about 10 m.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 422, in combination with the other features of the claim.

Claim 423 describes a combination of features including: “wherein the heater system is configured to sharply reduce the heat output at or near the selected temperature.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 423, in combination with the other features of the claim.

Claim 424 describes a combination of features including: “wherein the heater system is configured such that the heat output from at least a portion of the system decreases at or near the selected temperature due to the Curie effect.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 424, in combination with the other features of the claim.

Claim 425 describes a combination of features including: “wherein the heater system is configured such that an AC resistance of the electrical conductor increases with an increase in temperature up to the selected temperature, and wherein the system is configured such that an AC resistance of the electrical conductor decreases with an increase in temperature above the selected temperature.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 425, in combination with the other features of the claim.

Claim 426 describes a combination of features including: “wherein the system is configured to apply AC of at least about 70 amps to the electrical conductor.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 426, in combination with the other features of the claim.

Claim 427 describes a combination of features including: “wherein at least one of the electrical conductors comprises a turndown ratio of at least about 2 to 1.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 427, in combination with the other features of the claim.

Claim 428 describes a combination of features including: “wherein the system is configured to apply AC at about 180 Hz.” The cited art does not appear to teach or suggest at

least the above-quoted features of claim 428, in combination with the other features of the claim.

Claim 429 describes a combination of features including: “wherein the heater system is configured to withstand operating temperatures of about 250 °C or above.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 429, in combination with the other features of the claim.

Claim 430 describes a combination of features including: “wherein the heater system withstands operating temperatures of about 250 °C or above.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 430, in combination with the other features of the claim.

Claim 431 describes a combination of features including: “wherein the electrical conductor is configured to automatically provide the reduced amount of heat above or near the selected temperature.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 431, in combination with the other features of the claim.

Claim 433 describes a combination of features including: “providing the AC at a voltage above about 650 volts.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 433, in combination with the other features of the claim.

Claim 434 describes a combination of features including: “providing the AC to at least one of the electrical conductors at or above the selected temperature.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 434, in combination with the other features of the claim.

Claim 435 describes a combination of features including: “providing the AC at a frequency of about 180 Hz.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 435, in combination with the other features of the claim.

Claim 437 describes a combination of features including: “providing an initial electrically resistive heat output when the electrical conductor providing the heat output is at least about 50 °C below the selected temperature, and automatically providing the reduced amount of heat above or near the selected temperature.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 437, in combination with the other features of the claim.

Claim 439 describes a combination of features including: “providing a relatively constant heat output when the ferromagnetic material is in a temperature range between about 300 °C and about 600 °C.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 439, in combination with the other features of the claim.

Claim 440 describes a combination of features including: “providing a relatively constant heat output when the ferromagnetic material is in a temperature range between about 100 °C and about 750 °C.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 440, in combination with the other features of the claim.

Claim 441 describes a combination of features including: “wherein an AC resistance of at least one of the electrically resistive sections decreases above the selected temperature to provide the reduced amount of heat.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 441, in combination with the other features of the claim.

Claim 442 describes a combination of features including: “wherein the electrically resistive ferromagnetic material has a thickness of at least about $\frac{3}{4}$ of a skin depth of AC at the Curie temperature of the ferromagnetic material.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 442, in combination with the other features of the claim.

Claim 445 describes a combination of features including: “wherein the reduced amount of heat is less than about 400 watts per meter of length of an electrical conductor.” The cited art

does not appear to teach or suggest at least the above-quoted features of claim 445, in combination with the other features of the claim.

Claim 446 describes a combination of features including: “controlling a skin depth in at least one of the electrically resistive sections by controlling a frequency of the applied AC.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 446, in combination with the other features of the claim.

Claim 447 describes a combination of features including: “applying additional current to at least one of the electrically resistive sections as the temperature of such electrically resistive sections increases until the temperature is at or near the selected temperature.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 447, in combination with the other features of the claim.

Claim 448 describes a combination of features including: “wherein an amount of heat output provided from at least one of the electrically resistive sections is determined by an amount of current applied to at least one of the electrical conductors.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 448, in combination with the other features of the claim.

Claim 449 describes a combination of features including: “controlling an amount of heat provided by at least one of the electrically resistive sections by controlling an amount of current applied to at least one of the electrical conductors.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 449, in combination with the other features of the claim.

Claim 450 describes a combination of features including: “applying current of at least about 70 amps to at least one of the electrical conductors.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 450, in combination with the other features of the claim.

Claim 451 describes a combination of features including: “applying current of at least about 100 amps to at least one of the electrical conductors.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 451, in combination with the other features of the claim.

Claim 453 describes a combination of features including: “wherein the AC supply is configured to provide AC at a voltage above about 650 volts.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 453, in combination with the other features of the claim.

Claim 454 describes a combination of features including: “wherein the AC supply is configured to provide AC at a voltage above about 1000 volts.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 454, in combination with the other features of the claim.

Claim 455 describes a combination of features including: “wherein the heater system is configured to provide heat to a subsurface formation.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 455, in combination with the other features of the claim.

Claim 458 describes a combination of features including: “wherein the ferromagnetic material comprises iron, nickel, chromium, cobalt, tungsten, or a mixture thereof.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 458, in combination with the other features of the claim.

Claim 459 describes a combination of features including: “wherein the heat output below the selected temperature is greater than about 400 watts per meter of length of the electrical conductor.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 459, in combination with the other features of the claim.

Claim 460 describes a combination of features including: “wherein at least one portion of the electrical conductor is configured to comprise a relatively flat AC resistance profile in a temperature range between about 100 °C and 750 °C.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 460, in combination with the other features of the claim.

Claim 461 describes a combination of features including: “wherein the heater system is configured to sharply reduce the heat output at or near the selected temperature.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 461, in combination with the other features of the claim.

Claim 462 describes a combination of features including: “wherein the system is configured to apply AC of at least about 70 amps to the electrical conductor.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 462, in combination with the other features of the claim.

Claim 463 describes a combination of features including: “wherein at least one of the electrical conductors comprises a turndown ratio of at least about 2 to 1.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 463, in combination with the other features of the claim.

Claim 464 describes a combination of features including: “wherein the system is configured to apply AC at about 180 Hz.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 464, in combination with the other features of the claim.

Claim 465 describes a combination of features including: “wherein the electrical conductor is configured to automatically provide the reduced amount of heat above or near the selected temperature.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 465, in combination with the other features of the claim.

The cited art does not appear to teach, suggest, or provide motivation for systems or methods for heating at an AC voltage above about 200 volts in which a reduced amount of heat is provided above or near a selected temperature as described in the claims. Applicant respectfully requests removal of the rejection of claims 409, 432, 452, and the claims dependent thereon.

D. The Claims Are Not Obvious Over EP130671 In View of Holen And Further In View of Pritchett Pursuant To 35 U.S.C. §103(a)

Claims 412, 413, 416, 436, 438, 443, and 456 were rejected under 35 U.S.C. §103(a) as being unpatentable over EP130671 in view of Holen and further in view of U.S. Patent No. 3,757,860 to Pritchett (hereinafter "Pritchett"). Applicant respectfully disagrees with this rejection.

Claim 412 describes a combination of features including: "wherein the heater system is configured to provide heat to a subsurface formation." Claim 413 describes a combination of features including: "wherein the heater system is configured to provide heat to a hydrocarbon containing formation." Claim 416 describes a combination of features including: "wherein the heater system is configured to provide heat to at least a portion of an opening in a subsurface formation." Claim 436 describes a combination of features including: "placing one or more of the electrical conductors in a wellbore in a subsurface formation." Claim 438 describes a combination of features including: "allowing heat to transfer from at least one of the electrically resistive sections to at least a part of a subsurface formation." Claim 443 describes a combination of features including: "allowing heat to transfer from at least one of the electrically resistive sections to at least a part of a subsurface formation, wherein the subsurface formation comprises a hydrocarbon containing formation." Claim 456 describes a combination of features including: "wherein the heater system is configured to provide heat to a hydrocarbon containing formation."

The cited art does not appear to teach or suggest systems or methods for heating a

subsurface formation or a hydrocarbon containing formation in which a reduced amount of heat is provided above or near a selected temperature as described in the claims.

Pritchett states:

According to this invention, an alternating electrical current is applied directly to a pipe which extends longitudinally into the wellbore, preferably to the outermost pipe in the well. According to this invention, sufficient heating of the well pipe to maintain at least the outer surface of the well pipe to which alternating current is applied at a temperature which causes thawing of ice or which prevents freezing of the water adjacent said pipe, or which prevents hydrate formation, or which reduces viscosity of the liquid produced, can be achieved by controlling the frequency of the alternating current to cause a skin effect, as hereinafter defined, and to increase the effective electrical impedance of the pipe to the alternating current, and returning said electrical current beneath the portion of the well to be heated to the earth's surface. (Pritchett, column 2, lines 37-53).

Pritchett also states:

Another important reason for the use of alternating current is that with the alternation of the current through the electrical circuit there comes an inductance effect which causes the current, for example, passing through casing 4, to tend to flow along the surface of the casing rather than through the interior of the casing. This inductance effect is often termed a "skin effect." An additional result that accompanies the skin effect is that the effective electrical impedance of the casing to the alternating current being applied thereto increases above the normal impedance value of that pipe.

(Pritchett, column 5, line 63 to column 6, line 6)

Pritchett appears to teach or suggest limiting the alternating current to the skin of the heater to achieve the effects described above. Pritchett does not appear to teach or suggest providing a reduced amount of heat above or near a selected temperature. In addition, Pritchett appears to teach or suggest limiting the temperature of the heater to temperatures that are well below the Curie temperature of the ferromagnetic material. Thus, Pritchett does not appear to teach or suggest operating at temperatures anywhere near temperatures at which the heater would provide a reduced amount of heat.

EP130671 states: "Below the Curie temperature, the majority of the current flows in the

magnetic layer when the thickness of this layer is nominally one skin depth of the material below the Curie temperature. In the region of the Curie temperature, the majority of the current now flows in the copper and the resistance drops dramatically.” (EP130671, page 3, lines 1-6).

Pritchett does not appear to teach or suggest allowing the current, at any time, to flow outside of the skin depth of the heater as described in EP130671. Modifying Pritchett in view of EP130671 would appear to teach away from the intended purpose of the invention of Pritchett of having a heater that limits current to the skin depth of the heater. Pritchett also does not appear to teach or suggest operating in the region of the Curie temperature. Modifying Pritchett in view of EP130671 would appear to teach away from the intended purpose of the invention of Pritchett of operating at temperatures well below the Curie temperature.

In addition, EP130671 does not appear to teach, suggest, or provide motivation for providing heat to a part of a subsurface formation. Thus, there is no suggestion or motivation in EP130671 to utilize the teachings of EP130671 and apply them to the teachings of Holen or Pritchett. Applicant submits that a person skilled in the art would have no objective reason to combine the teachings of Holen, Pritchett, and EP130671 to teach all the claim features including, but not limited to, providing a reduced amount of heat above or near a selected temperature and providing heat to at least a part of a subsurface formation.

In addition, Pritchett states:

By employing the skin effect, as defined hereinafter, a loss of current and short-circuiting problems are minimized because by utilizing the skin effect the results of this invention are achieved even if another pipe is touching or otherwise electrically connected to the pipe which is carrying the alternating current according to this invention. Also, by employing the skin effect, where an inner pipe is touching the outer pipe or at other similar points of contact along the outer pipe severe local heating and even welding of the two pipes together is avoided. The avoidance of local heating at any such point of contact is important to avoid damage to the pipes or permafrost or both.
(Pritchett, column 3, lines 19-31)

Pritchett appears to teach or suggest limiting current to skin depth of the ferromagnetic material so that little or no current leaks to any other electrically conducting materials in contact

with the ferromagnetic material. In contrast, EP 130671 states: “In operation, as the Curie temperature of the first layer is approached and its permeability rapidly decreases, the current spreads into the copper layer and into the second magnetic layer. The total resistance of the structure, due to the presence of the copper, drops dramatically providing a high autoregulating ratio.” (EP130671, page 8, lines 9-14). EP130671 appears to teach or suggest electrically coupling one or more other materials to the ferromagnetic material and allowing the current to conduct into the other materials as the Curie temperature of the ferromagnetic material is approached.

The cited art does not appear to teach or suggest at least the above-quoted features of claims 412, 413, 416, 436, 438, 443, and 456.

E. The Claims Are Not Obvious Over EP130671 In View of Holen And Further In View of Vanegmond Pursuant To 35 U.S.C. §103(a)

Claims 414, 444, and 457 were rejected under 35 U.S.C. §103(a) as being unpatentable over EP130671 in view of Holen and further in view of U.S. Patent No. 4,572,299 to Vanegmond et al. (“Vanegmond”). Applicant respectfully disagrees with this rejection.

Claim 414 describes a combination of features including: “wherein the heater system is configured to provide heat to a hydrocarbon containing formation, and wherein the heater system is configured to pyrolyze at least some hydrocarbons in the formation.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 414, in combination with the other features of the claim.

Claim 444 describes a combination of features including: “allowing heat to transfer from at least one of the electrically resistive sections to at least a part of a hydrocarbon containing formation, and further comprising pyrolyzing at least some hydrocarbons in the formation.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 444, in combination with the other features of the claim.

Claim 457 describes a combination of features including: “wherein the heater system is configured to provide heat to a hydrocarbon containing formation, and wherein the system is configured to pyrolyze at least some hydrocarbons in the formation.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 457, in combination with the other features of the claim.

Neither EP130671 nor Holen appears to teach, suggest, or provide motivation for heating a hydrocarbon formation and pyrolyzing at least some hydrocarbons in the formation. Thus, there is no objective reason to combine the teachings of EP130671 nor Holen with the teachings of Vanegmond.

F. The Claim Is Not Obvious Over EP130671 In View of Holen And Further In View of CA2152521 Pursuant To 35 U.S.C. §103(a)

Claim 417 was rejected under 35 U.S.C. §103(a) as being unpatentable over EP130671 in view of Holen and further in view of Canadian Pat. No. 2,152,521 to Bridges. Applicant respectfully disagrees with this rejection.

Claim 417 describes a combination of features including: “wherein the heater system comprises three or more electrical conductors, and wherein at least three of the electrical conductors are configured to be coupled in a three-phase electrical configuration.” The cited art does not appear to teach or suggest at least the above-quoted features of claim 417, in combination with the other features of the claim.

G. Double Patenting Rejection

Claims 409-414 and 416-465 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 466-518 of copending U.S. Pat. Appl. No. 10/693,700 in view of Holen. Claims 409-414 and 416-465 were

also provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 268-408, 625, 659, 685, and 710 of copending U.S. Pat. Appl. No. 10/693,816 in view of Holen. Upon the present application being in condition for allowance but for the double patenting rejections, Applicant will provide arguments for the inappropriateness of the double patenting rejections and/or provide a terminal disclaimer.

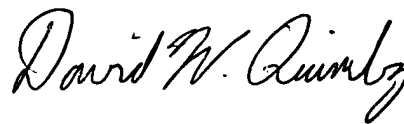
H. Other Pertinent Prior Art

Applicant has reviewed the other pertinent prior art identified by the Office Action. Applicant believes that for at least the reasons outlined above in sections C-G of this document that the cited art does not appear to teach or suggest the features of the claims.

I. Additional Comments

It is believed that no fees are due in association with the filing of this document. If any extension of time is necessary, Applicant hereby requests the appropriate extension of time. If any fees are required, please charge those fees to Meyertons, Hood, Kivlin, Kowert & Goetzel, P.C. Deposit Account Number 50-1505/5659-20900/EBM.

Respectfully submitted,



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